

EPITAXIAL GROWTH

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Patent Number: JP4031391
Publication date: 1992-02-03
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Requested Patent: ☐ JP4031391
Application Number: JP19900131786 19900523
Priority Number(s):
IPC Classification: C30B23/08; C30B29/40; H01L21/203
EC Classification:
EC Classification:
Equivalents:

Abstract

PURPOSE: To form heterogeneous structure having interface qualities suitable for a local range having a size of mono-atomic layer in the direction of film thickness by making a raw material molecule of compound semiconductor comprising two or more constituent elements adsorb on a substrate and irradiating an ungrowing range with light rays.

CONSTITUTION: A GaAs substrate 13 having cleaned surface is attached to a substrate holder 12, a growing chamber 10 is evacuated into high vacuum by a vacuum pump 11 and the substrate 13 is heated. Then, a material gas of group V is introduced to a molecular beam source 14, the substrate is irradiated with the beam of group V and an oxide layer on the surface of the substrate 13 is removed. Then, one material gas of constituent elements of a compound semiconductor is fed to a molecular beam source 16 to grow a buffer layer and then introduction of the material gas of group V to the molecular beam source 14 is stopped. The substrate is irradiated with molecule of the other material gas from a molecular beam source 17, a monomolecular layer is chemically adsorbed on the surface of the substrate 13 and the substrate 13 is irradiated with energy light having such a sufficient energy to eliminate the adsorbed molecule from a light beam induction inlet 15 to eliminate the adsorbed molecule in an ungrowing range.